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5 Safety system for operating at least one electrically
 operated locking device of a vehicle

10 The invention relates to a safety system for operating
at least one electrically operated locking device of a
vehicle, according to the precharacterizing clause of
claim 1.

15 DE 27 51 821 A1 describes an automatic safety system
for vehicles which is controlled by a driver's reflex.
At a certain degree of operation of the brakes, among
other things the doors are automatically locked, so
that, in the event of a crash (impact), the occupants
are not hurled out of the vehicle.

20 DE 199 06 049 A1 discloses a method for operating an
electrically operated locking device of a glove
compartment flap, in which the electric opening release
of the locking device is dependent on sensor values
which are related to the driving situation or are
related to an event. In this case, the opening release
25 of the locking device can be suppressed for a certain
period of time following a driving-critical situation.
An inadvertent opening operation in the event of a
crash, which operation involves an increased risk of
injury, can therefore be avoided.

30 The invention is based on the object of specifying a
safety system for operating at least one electrically
operated locking device of a vehicle, which ensures
that the occupant is protected against an unintentional
35 opening operation from the outside.

The object is achieved by a safety system for operating at least one electrically operated locking device of a door of a vehicle with the features of claim 1.

5 According to the invention, the electric opening blockage of the locking device depends on sensor values which are related to the driving situation and indicate an impact. In this case, the safety system is provided for operating at least one electrically or else
10 fluidically operated locking device of a door of a vehicle. This avoids the unintentional opening of body elements, in particular of doors, due to acceleration forces or accident-induced actions during a hazardous situation. The body elements in particular also
15 comprise rear wall doors, flaps and lids. The occupants are prevented from unintentionally leaving the vehicle and are protected from external, endangering actions. The electric opening blockage cannot be influenced by the driver.

20 In a refinement in which the electric opening blockage as a function of a seat being occupied can be activated only for the locking devices of those body elements which are adjacent to the occupant, it is advantageous
25 if the door is a tailgate or a rear door of the vehicle. A complete blockage of the access possibilities to the vehicle is avoided by the dependency of the electric opening blockage on being activated as a function of the seat being occupied.

30 Only the locking devices of those doors which are situated in the immediate, reachable region surrounding the occupants are activated by the electric opening blockage and blocked during the hazardous situation.

35 It is advantageous if the electric opening blockage as a function of a hazardous situation can be activated only for the locking devices of those body elements

which are to be regarded as relevant to the safety of the occupants in the hazardous situation. In this case, the electric opening blockage of the locking device can take place as a function of the speed, the acceleration
5 and/or a rate of rotation of the vehicle. An individual protection of an occupant is ensured as a function of the hazardous situation present, with only the doors most necessary for comprehensive protection of the occupants being activated by the electric opening
10 blockage over the course of the hazardous situation.

Further advantageous refinements of the invention are specified in the subclaims.

15 The invention is explained in more detail with reference to an exemplary embodiment in the single figure, the figure showing, in an excerpt, a safety system for operating electrically operated locking devices of a vehicle in a diagrammatic representation.

20 The safety system 1 (illustrated in the figure) for operating electrically operated locking devices 2 to 4 of a vehicle (not illustrated specifically) has a control device 5 with which the locking devices 2 to 4
25 can be activated. One locking device 2 to 4 in each case is a functional component of an outer body element of the vehicle. The body elements are, for example, doors 6, tailgate 7 or rear door 8 of the vehicle. However, other components of the vehicle which can be
30 opened from the outside and the opened state of which could limit the safety of an occupant in a hazardous situation are also suitable.

An electric opening blockage of the locking device 2 to
35 4 takes place as a function of sensor values which are related to the driving situation and indicate an impact. For this purpose, the control device 5 is activated by a sensor 9 for measuring the speed of the

vehicle, by a sensor 10 for measuring the acceleration of the vehicle, by a sensor 11 for measuring a rate of rotation of the vehicle, by sensors 12 for detecting the seat occupancy in the vehicle and by a sensor 13
5 for detecting an accident situation of the vehicle, in particular a crash sensor, an image-providing sensor or a radar sensor. The opening blockage by means of the control device 5 can take place as a function of the signal of a sensor 9 to 13 or else in combination of a
10 plurality of sensors 9 to 13, with it being possible for the combination to take place, for example, by means of a functional logic operation. In addition, however, other sensors 9 to 13 for sensing sensor values which are related to the driving situation or
15 are related to an event, such as, for example, a distance sensor, may also be provided.

In a refinement of the invention, the electric opening blockage as a function of the seat occupancy can be
20 activated only for the locking devices of those doors 6 and tailgate 7 or rear door 8 of the vehicle which are adjacent to the occupant. For example, in the case of a four-door sedan, it is appropriate, if the front seats are occupied, only to activate the two doors 6 in the
25 front region of the interior of the vehicle by the electric opening blockage. In the case of an additional occupancy of the rear seats, the two rear doors 6 of the vehicle would also additionally have to be activated by the electric opening blockage to provide a
30 blockage during the hazardous situation. Owing to the fact that only the minimum necessary number of external body elements are blocked in a hazardous situation by the electric opening blockage in order to ensure the safety of the occupants, it is ensured that, after an
35 accident and a possible failure of the electric closing and opening functions, access to the vehicle is nevertheless ensured or the occupants can leave the vehicle independently, since not all access

possibilities are blocked by the electric opening blockage.

5 In a further refinement of the invention, the electric opening blockage as a function of a hazardous situation can be activated only for the locking devices 2 to 4 of those body elements which are to be regarded as relevant to the safety of the occupants in the hazardous situation present. This means that, for
10 example, in the case of a sharp rotation of the vehicle due to the whirling and centrifugal forces in effect, only the door 6 on the outer side of the curve is blocked by the electric opening blockage and, in the case of an additional occupancy of one or more rear
15 seats, also the corresponding rear door 6 is blocked by the electric opening blockage. In the case of a typical collision accident which takes place directly from the rear, if appropriate not one locking device 2 to 4 of the body elements would have to be activated by the
20 electric opening blockage. A changing of the current state of the electric opening blockage for the various body elements over the course of the hazardous situation as a function of the movement state of the vehicle is likewise possible.

25 In the case of the electric opening blockage, this state can be maintained for a period of time. The period of time for maintaining it may comprise a predetermined length of time or else may be variable as
30 a function of the current values of the sensors 9 to 13.

35 With the safety system 1 according to the invention for operating electrically operated locking devices 2 to 4 of the vehicle, a comprehensive protection during and after a hazardous situation is ensured for the occupants. During the hazardous situation, an unintentional leaving of the vehicle by the occupants

is prevented, with it additionally being ensured that subsequently an access to the vehicle from the outside is possible or the occupants can leave the vehicle by themselves. The vehicles are generally equipped as
5 standard with the sensors 9 to 13, so that the safety system 1 can be realized cost-effectively with only a little outlay.